Abstract

A method, and a system of mitigating interference effects under a communication environment including a first spread spectrum (SS) transmission scheme and a second spread spectrum (SS) transmission scheme in the same frequency band are proposed in this present invention. Firstly, responsive to a received signal, output number of signal of the first SS transmission scheme and the second SS transmission scheme. Secondly, retrieve the timing, phase and amplitude information of signals of the first SS transmission scheme in the received signal, and the timing, phase and amplitude information of signals of the second SS transmission scheme. Generate a plurality of linearly-modulated signals based on a predetermined manner, correlate the received signal based on the plurality of linearly-modulated signals to generate a correlated outputs. Finally, selectively produce an estimated information sequence carried by the signals of the first SS transmission scheme and the signals of the second SS transmission scheme based on the correlated outputs in another predetermined manner.

Such a method and a system not only extend the ability of conventional linear multi-user detection to the FH-CDMA (frequency hopping code division multiple access) and the DS-FH-CDMA (direct sequence and frequency hopping code division multiple access) multi-user communications systems, but also remove the limitations of the conventional linear multi-user detection on linearly modulated signals. In addition, the multi-user synchronizers proposed in this invention, which estimate the received timings, phases, and amplitudes of the interfering and the desired spread spectrum signals with feasible complexity, further complete the interference suppression communications system. This invention is applicable to various

environments. For example: the source of DSSS signals could be derived from the IEEE 802.11b devices or perhaps the IEEE 802.15.3 devices; the source of FHSS signals could be derived from the IEEE 802.15.1 (Bluetooth) devices or the HomeRF devices. Moreover, this invention is not limited to the wireless communications as it is equally applicable to the optical communications systems (e.g. the HFC (hybrid-fiber-coax) networks) and the wired communications systems.